

# Saproxylic beetle communities of trembling aspen deadwood

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# Saproxylic Beetles

- Sensitive to disturbance
- Less studied in Canada
- Current management maintains only pre-harvest quantity



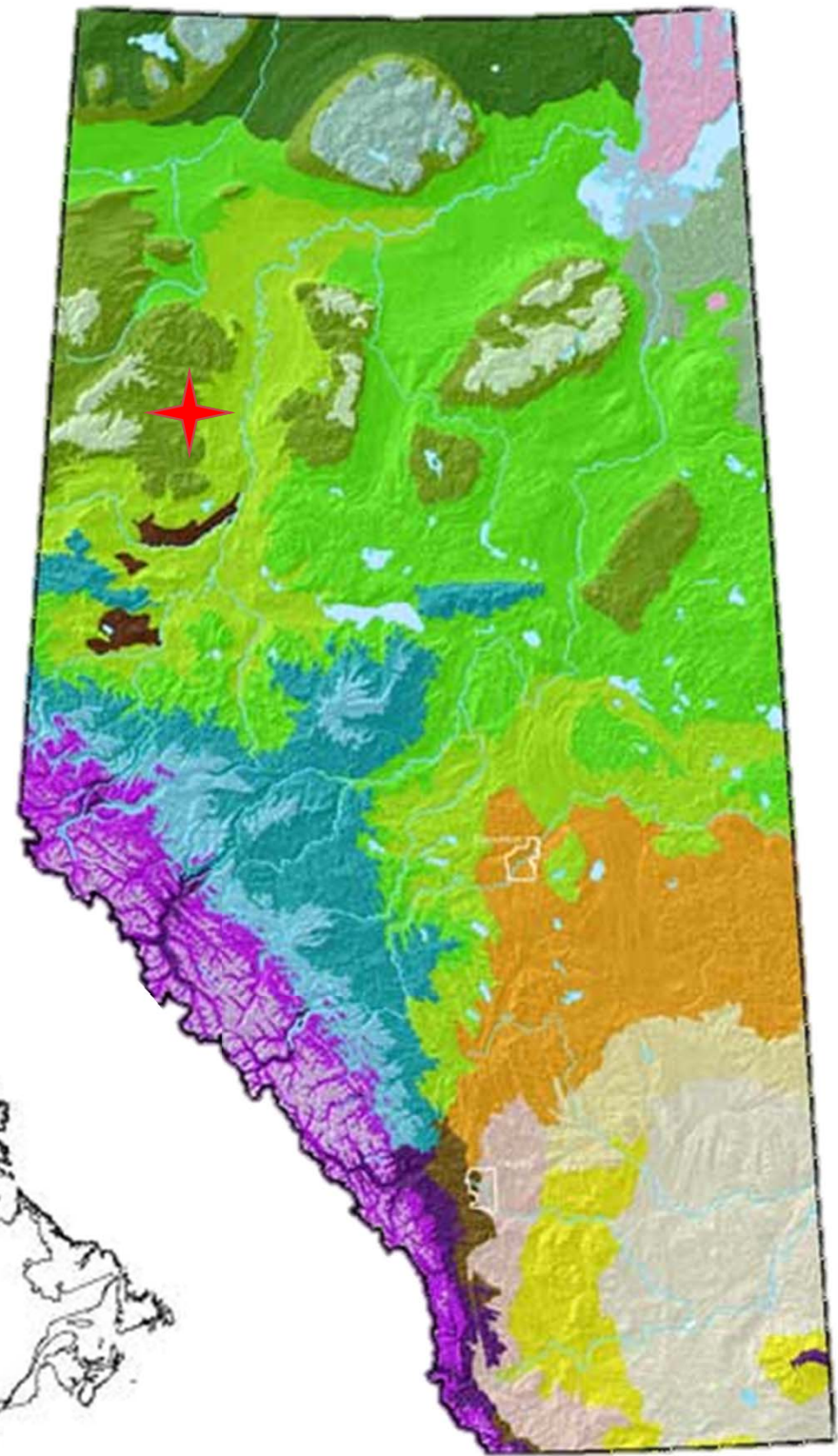
# Objectives

- Determine saproxylic beetle habitat associations in trembling aspen
  - Influence of deadwood **position**, **decay class** and **size class**



# Study Area

- Near the EMEND research site in NW Alberta, Canada
- Boreal mixedwood forest



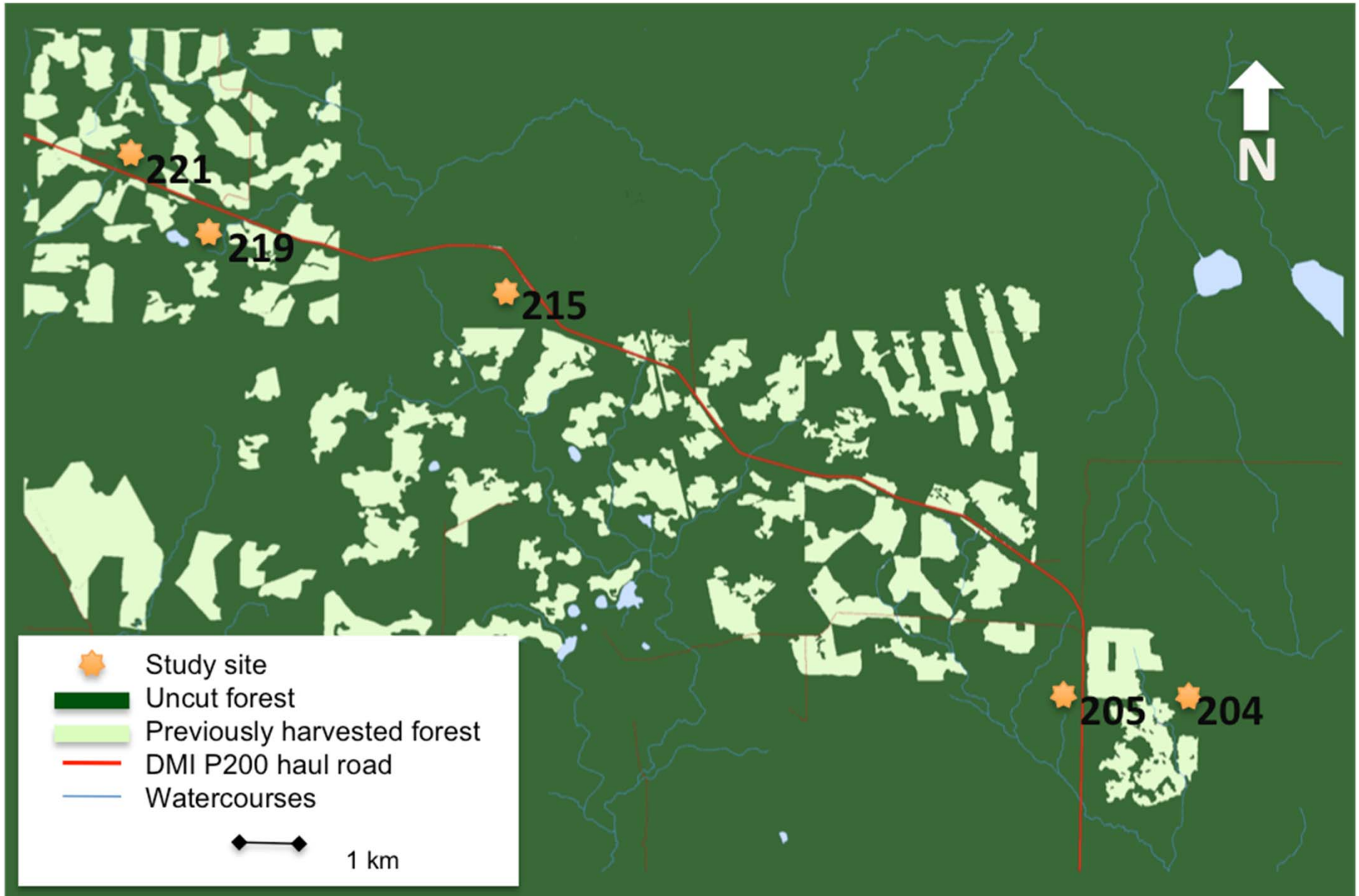


Jason Edwards, EMEND Project



# Study Area

- 5 mature stands, aspen dominated





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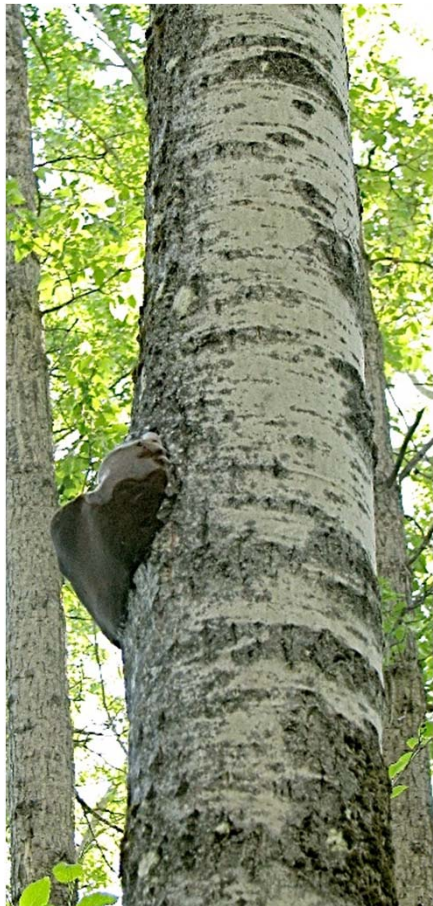
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# Sampling Protocol

- selected replicates of standing and fallen wood in each stand
- various decay classes (live – well decayed)





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- Various collection methods:
  - Emergence Traps
  - Rearing Drums
  - Extraction funnels
  - Collecting by hand





# Data Analyses

- Excluded Aleocharinae (Staphylinidae)
- Excluded non-saproxyllic spp.
- Volume-standardized abundance data
- Replicate samples pooled





# Results

- Identified 248 saproxylic spp.
- Many new provincial records
  - 8 confirmed new species to science



**Monotomidae:**  
*Rhizophagus* sp.  
(near *pseudobrunneus*)  
Confirmed by Yves Bousquet

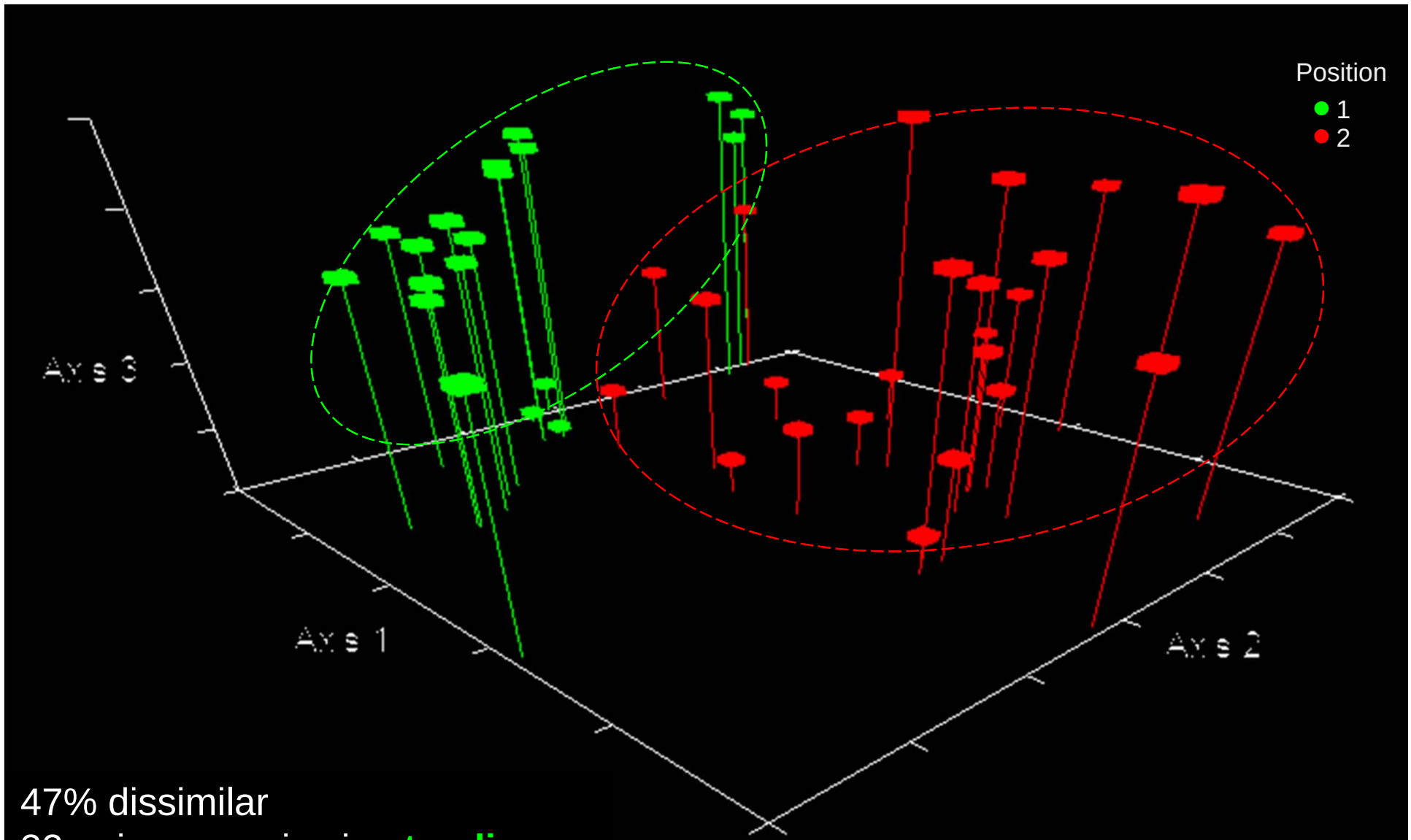


**Latridiidae:**

1 new *Melanophthalma* sp.; 6+ new *Corticaria* spp.

Confirmed by Wolfgang Rucker

# Deadwood **Position**



47% dissimilar  
32 unique species in **standing**  
43 unique species in **fallen**  
41 **shared species**

PERMANOVA:  $p=0.0005$

3-D NMS  
Stress: 16.306  
 $p= 0.0040$   
Bray-Curtis dissimilarity



# Deadwood **Position**

➤ 52 Indicator spp ( $>25$  IV,  $p < 0.05$ )

Standing

*Megatoma perversa*

Dermestidae

IV= 52.1,  $p = 0.0006$



Photo: Andreas Herrmann

*Canifa pallipes*

Scraptiidae

IV= 62.4,  $p = 0.0002$



Photo: Guy A. Hanley

Fallen

*Corticaria elongata*

Latridiidae

IV= 42.3,  $p = 0.0028$



*Tachyporus borealis*

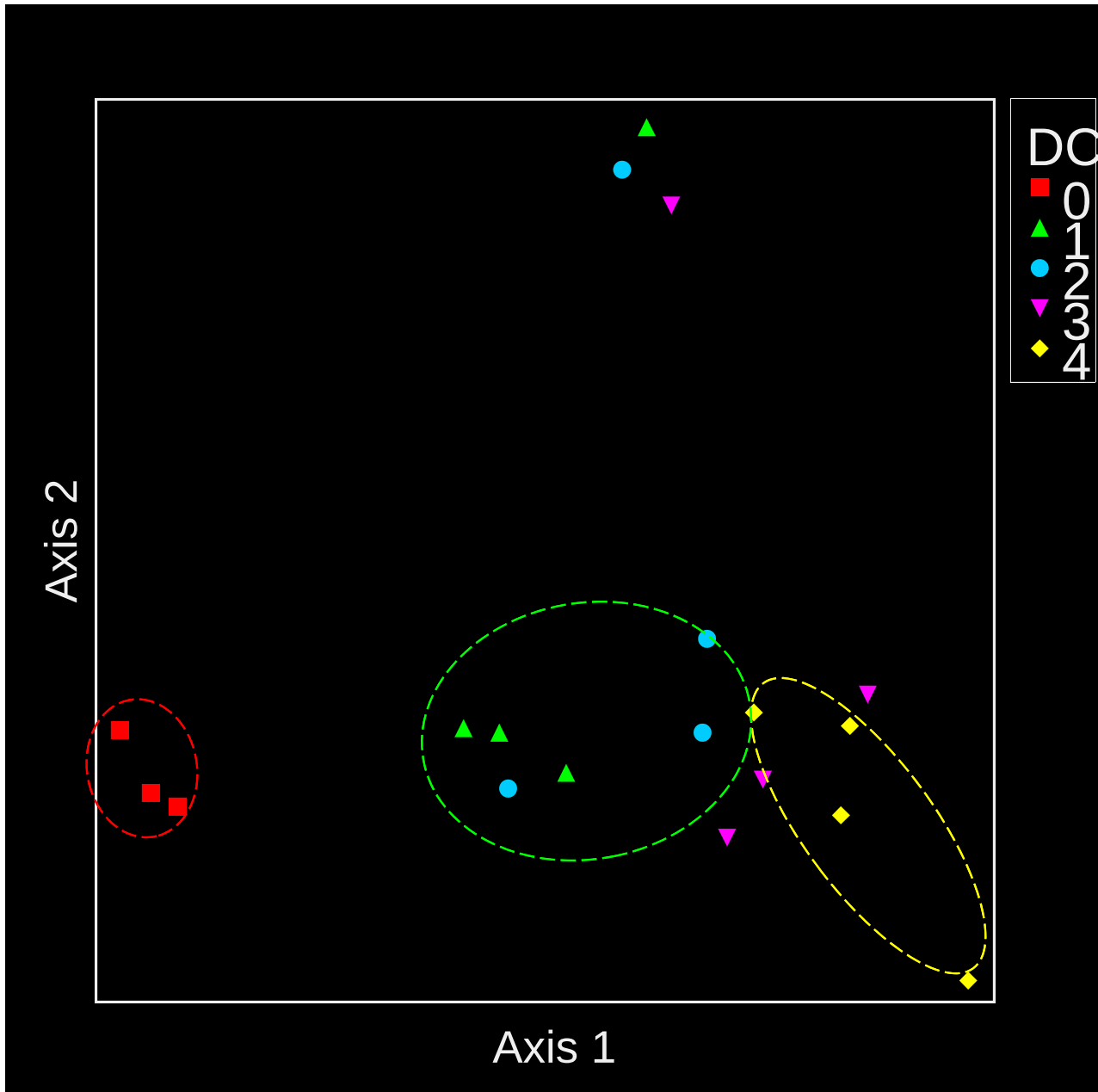
Staphylinidae

IV= 34.6,  $p = 0.0060$



Photos: C. Wood

# Standing Decay Class



PERMANOVA:  $p=0.0194$

2-D NMS Stress: 12.55  
 $p= 0.0040$   
Bray-Curtis dissimilarity



# Standing Decay Class

➤ 9 Indicator spp ( $>25$  IV,  $p < 0.05$ )

*Epuraea terminalis*

Nitidulidae

DC 0



Michele B. Price

*Clypastraea lugubris*

Corylophidae

DC1



C. Wood

*Hemicoelus carinatus*

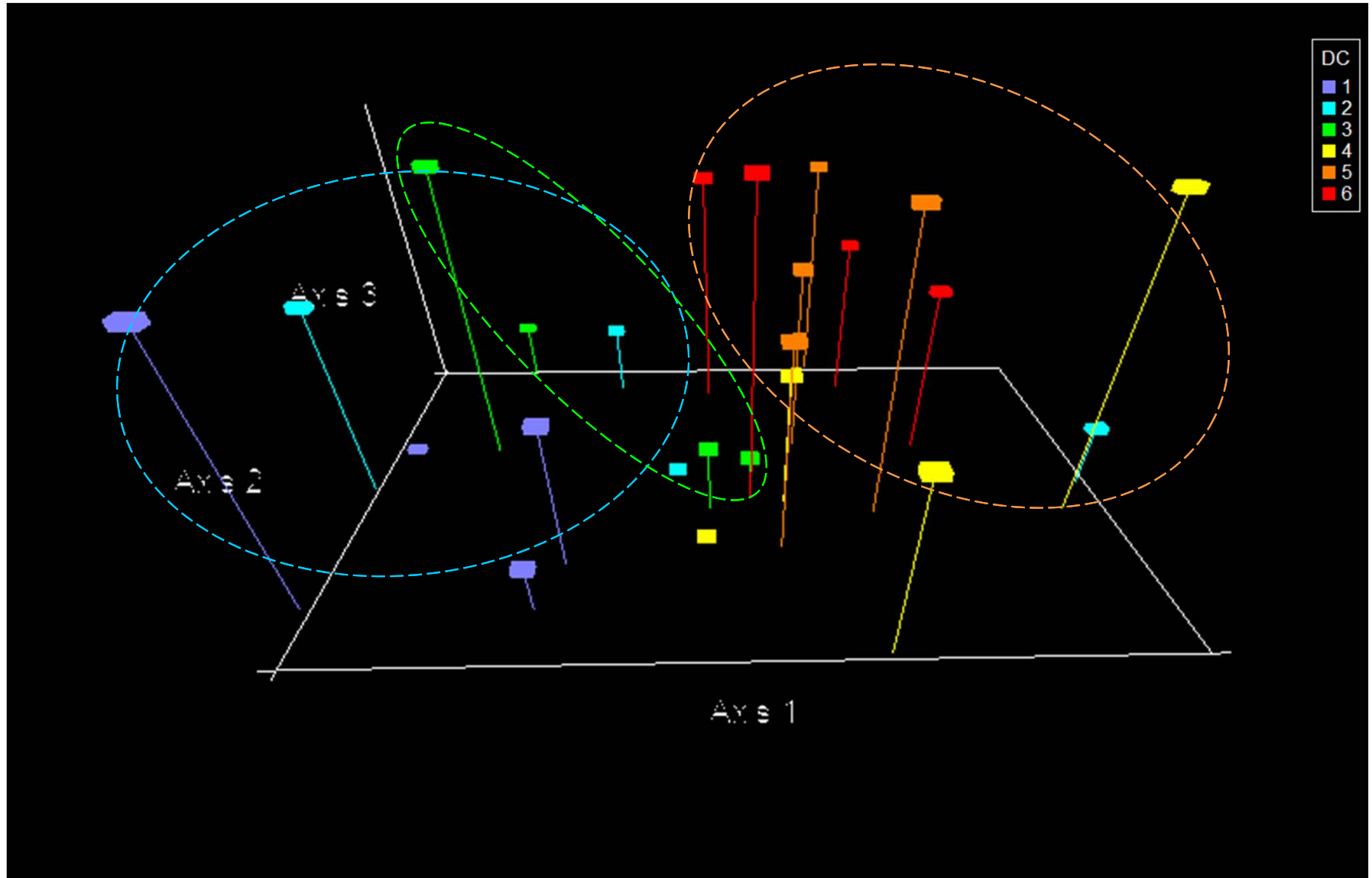
Anobiidae

DC4



C. Wood

# Fallen Decay Class



3-D NMS Stress: 13.87  
p= 0.0040

PERMANOVA: p=0.0335

Bray-Curtis dissimilarity



# Fallen Decay Class

➤ 4 Indicator spp ( $>25$  IV,  $p<0.05$ )

*Cucujus clavipes*

Cucujidae

DC 2



*Pseudopsis saggita*

Staphylinidae

DC5



*Lathrobium washingtoni*

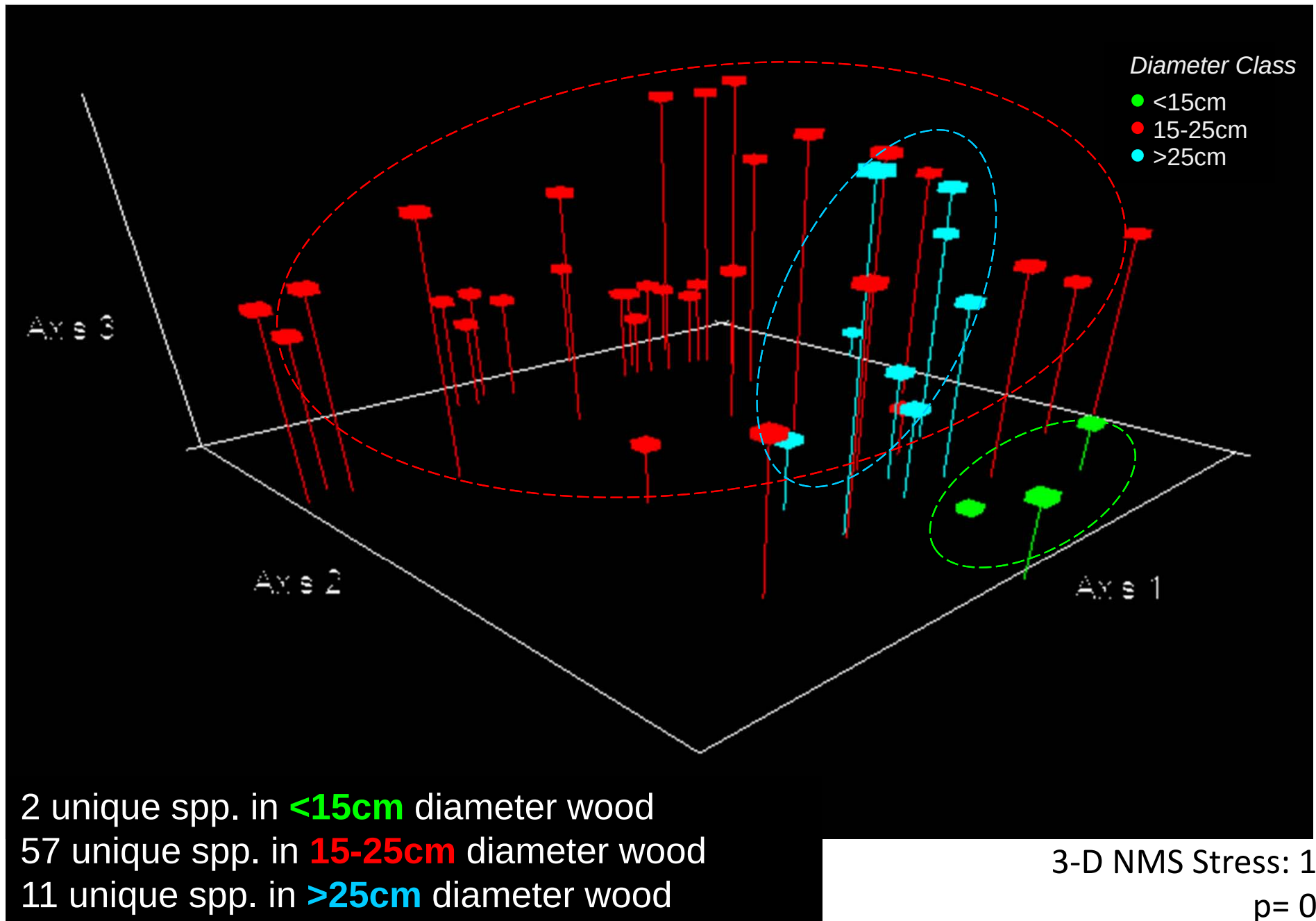
Staphylinidae

DC6



Photos: Charlene Wood

# Deadwood Size Class



PERMANOVA:  $p=0.006$

3-D NMS Stress: 16.306  
 $p= 0.0040$   
Bray-Curtis dissimilarity



# Deadwood **Size Class**

- 14 Indicator spp ( $>25$  IV,  $p < 0.05$ )
- All for wood  $>25$ cm diameter

*Ischnosoma splendidum*  
Staphylinidae



Tim Loh

*Typhaea stercorea*  
Mycetophagidae



K.V. Makarov

*Cartodere constricta*  
Latridiidae



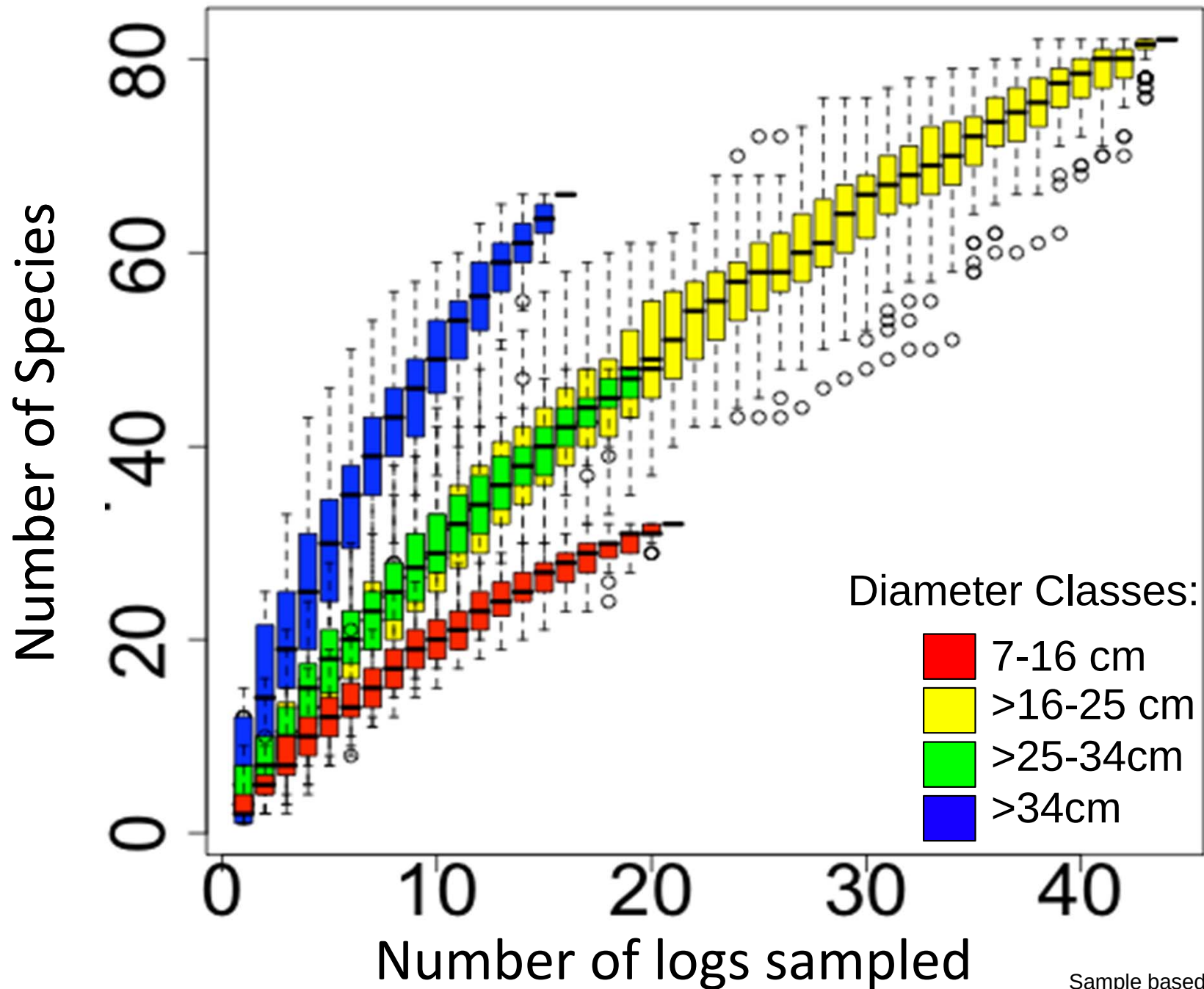
C. Wood

*Ampedus deletus*  
Elateridae



Guy A. Hanley

# Deadwood Size Class





# Conclusions

- Deadwood position, decay and size play a role in structuring the saproxylic beetle community
  - Need for management directives to maintain critical deadwood habitats through time
- Novel species and new provincial records
  - Improved faunistic records & habitat requirements
  - Responses to disturbance still needed for many spp.

# Acknowledgements

## *Collaborators:*

- A Jimmo, T Culen, Z Jumean, J Edwards, C Hahn (Field work)
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Ressources naturelles  
Canada  
Service canadien  
des forêts

SUSTAINABLE FOREST  
MANAGEMENT NETWORK



RÉSEAU DE GESTION  
DURABLE DES FORÊTS





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